

Subt. For, PTO-1449				Docket Number DIV-1140-3 (112766.159)		Application Number 09/663,620	
<b>INFORMATION DISCLOSURE IN AN APPLICATION</b>  (Use several sheets if necessary)				Applicant Jay M. Short			
				Filing Date September 15, 2000		Group Art Unit 1652	
Sheet	1	OF	4				

#19  
H.G.J  
6/3/03

U.S. Patent Documents						
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
NE	6,057,103	05/02/00	Short	435	6	
NE	6,054,267	04/25/00	Short	435	6	
NE	6,004,788	12/21/99	Short	435	183	
NE	5,976,862	11/02/99	Kauffman et al.	435	252-3	
NE	5,965,408	10/12/99	Short	435	91.1	
NE	5,945,329	08/31/99	Breddam et al.	435	223	
NE	5,939,250	8/17/99	Short	435	4	
NE	5,932,419	08/03/99	Bauer et al.	435	6	
NE	5,885,827	03/23/99	Wabl et al.	435	320.1	
NE	5,885,577	03/32/9	Alvarez	424	155.1	
<del>NE</del>	<del>5,837,458</del>	<del>11/17/98</del>	<del>Minshull et al.</del>	} reference of record		
<del>NE</del>	<del>5,830,721</del>	<del>11/09/98</del>	<del>Stemmer et al.</del>			
NE	5,824,514	10/20/98	Kauffman et al.	435	91.1	
NE	5,817,483	10/06/98	Kaufmann et al.	435	69.1	
NE	5,814,476	09/29/98	Kaufmann et al.	435	69.1	
<del>NE</del>	<del>5,811,238</del>	<del>09/22/98</del>	<del>Stemmer et al.</del>	} reference of record		
NE	5,789,166	08/04/98	Bauer et al.	435	6	
<del>NE</del>	<del>5,763,102</del>	<del>06/09/98</del>	<del>Kauffman et al.</del>			
<del>NE</del>	<del>5,723,023</del>	<del>03/03/98</del>	<del>Kauffman et al.</del>			
<del>NE</del>	<del>5,645,088</del>	<del>07/08/97</del>	<del>Vande Woude et al.</del>			
<del>NE</del>	<del>5,605,703</del>	<del>02/26/97</del>	<del>Stemmer</del>	} reference of record		
NE	5,389,537	02/14/95	Raines et al.	435	199	
NE	5,354,656	10/11/94	Sorge et al.	435	6	
NE	5,333,675	08/02/94	Mullis et al.	165	13	
<del>NE</del>	<del>5,284,485</del>	<del>10/20/98</del>	<del>Thompson et al.</del>			
NE	5,234,824	08/10/93	Mullis	435	91	
NE	5,223,409	06/29/93	Ladner et al.	435	69.7	
NE	5,198,346	03/30/93	Ladner et al.	435	69.1	
NE	5,187,083	02/16/93	Mullis	435	91	

EXAMINER <i>N. Theed</i>	DATE CONSIDERED <i>5/5/03</i>
EXAMINER: Initial if citation is considered, whether or not citation is in conformance with MPEP § 609: Draw Line through citation if not conformance and not considered. Include copy with next communication to applicant.	

NEWYORK 68635-1

*\* Reference could not be located*

Subt. For, PTO-1449				Docket Number DIV-1140-3 (112766.159)		Application Number 09/663,620	
<b>INFORMATION DISCLOSURE IN AN APPLICATION</b>  (Use several sheets if necessary)				Applicant Jay M. Short			
				Filing Date September 15, 2000		Group Art Unit 1652	
Sheet	2	OF	4				

ME	5,176,995	01/05/93	Sninsky et al.	435	6	
ME	5,096,815	03/17/92	Ladner et al.	435	69.1	
ME	4,965,188	10/23/90	Mullis et al.	435	199	
ME	4,959,312	08/25/90	Sirotkin	435	69	
ME	4,800,159	01/24/89	Mullis et al.	435	172.3	
ME	4,683,202	07/28/87	Mullis	435	91	
	<del>5,352,778</del>	<del>10/4/94</del>	<del>Comb et al.</del>			
	<del>5,500,363</del>	<del>3/19/96</del>	<del>Comb et al.</del>			
						reference of record

### Foreign Patent Documents

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	EP 0 316 018	5/17/89	EPO				
ME	WO 99/36553	7/22/99	PCT				
* *	<del>WO 98/58080</del>	<del>12/23/98</del>	<del>PCT</del>				
ME	WO 98/49286	11/05/98	PCT				
ME	WO 98/48024	10/29/98	PCT				
ME	WO 98/45331	10/15/98	PCT				
ME	WO 98/38297	9/3/98	PCT				
ME	WO 97/35957	10/2/97	PCT				
ME	WO 97/20950	6/12/97	PCT				
ME	WO 97/20078 ✓	6/5/97	PCT				
ME	WO 96/41865	12/27/96	PCT				
ME	WO 96/09411	3/28/96	PCT				
ME	WO 96/06188	2/29/96	PCT				
ME	WO 95/22625	8/24/95	PCT				
ME	WO 95 20039	7/27/95	PCT				
	<del>WO 91/16427</del>	<del>10/01/91</del>	<del>PCT</del>				
* *	<del>WO 91/12341</del>	<del>8/22/91</del>	<del>PCT</del>				
ME	WO 90/ 02809	3/22/90	PCT				
ME	WO 98/32845 ✓	7/30/98	PCT				

### Other Documents ( Including Author, Title, Date, Pertinent Pages, etc.)

ME	Arkin and Youvan, "Optimizing nucleotide mixtures to encode specific subsets of amino acids for semi-random mutagenesis," <i>Bio-technology (NY)</i> 10(3): 297-300 (Mar 1992)
ME	Burks et al., "In vitro scanning saturation mutagenesis of an antibody binding pocket," <i>Proc Natl Acad Sci USA</i> 94(2): 412-417 (1997 Jan 21)

EXAMINER <i>N. Hood</i>	DATE CONSIDERED <i>8/5/03</i>
EXAMINER: Initial if citation is considered, whether or not citation is in conformance with MPEP § 609: Draw Line through citation if not conformance and not considered. Include copy with next communication to applicant.	

NEWYORK 68635v1

\* \* Reference could not be located

Subt. For, PTO-1449				Docket Number DIV-1140-3 (112766.159)		Application Number 09/663,620	
<b>INFORMATION DISCLOSURE IN AN APPLICATION</b>  (Use several sheets if necessary)				Applicant <b>Jay M. Short</b>			
				Filing Date <b>September 15, 2000</b>		Group Art Unit <b>1652</b>	
Sheet	<b>3</b>	OF	<b>4</b>				

NE	Cadwell and Joyce, "Randomization of Genes by PCR Mutagenesis", PCR Methods and Applications, 2:28-33 (1992).
NE	Chen and Struhl, "Saturation mutagenesis of a yeast <i>his3</i> "TATA element": genetic evidence for a specific TATA-binding protein," <i>Proc Natl Acad Sci USA</i> <b>85</b> (8): 2691-2695 (Apr 1988)
NE	Chiang et al., "Mutagenic oligonucleotide-directed PCR amplification (Mod-PCR): an efficient method for generation random base substitution mutations in a DNS sequence element," <i>PCR Methods Appl</i> <b>2</b> (3): 210-217 (Feb 1993)
NE	Christian et al., "Simplified methods for construction, assessment and rapid screening of peptide libraries in bacteriophage," <i>J Mol Biol</i> <b>227</b> (3): 711-718 (1992 Oct 5)
NE	Cramer et al., "Construction and evolution of antibody-phage libraries by DNA shuffling", <i>Nature Medicine</i> 2:100-101 (1996)
NE	Cunniff and Mrogan, "Analysis of heat shock element recognition by saturation mutagenesis of the human <i>HSP70.1</i> gene promoter," <i>J Biol Chem</i> <b>268</b> (11): 8317-8324 (1993 Apr 15)
* *	<del>Quida et al., "Peptide on a phage: a vast library of peptides for identifying ligands," <i>Proc Natl Acad Sci USA</i> <b>87</b>(16): 6376-6382 (Aug 1990)</del>
NE	Dennis and Lazarus, "Kunitz domain inhibitors of tissue factor-factor VIIa. I. Potent inhibitors selected from libraries by phage display," <i>J Biol Chem</i> <b>269</b> (35): 22129-22136 (1994 Sep 2)
NE	Derbyshire et al., "A simple and efficient procedure for saturation mutagenesis using mixed oligodeoxynucleotides," <i>Gene</i> <b>46</b> (2-3): 145-152 (1986)
NE	Goff et al., "Efficient saturation mutagenesis of a pentapeptide coding sequence using mixed oligonucleotides," <i>DNA</i> <b>6</b> (4): 381-388 (Aug 1987)
NE	Hermes et al., "Searching sequence space by definably random mutagenesis: Improving the catalytic potency of an enzyme", <i>PNAS USA</i> <b>87</b> :696-700 (Jan. 1990)
* *	<del>Hill and Struhl, "Mutagenesis with degenerate oligonucleotides: an efficient method for saturating a defined DNA region with base pair substitutions," <i>Methods Enzymol</i> <b>155</b>: 556-568 (1987)</del>
NE	Horwitz and DiMaio, "Saturation mutagenesis using mixed oligonucleotides and M13 templates containing uracil," <i>Methods Enzymol</i> <b>185</b> : 599-611 (1990)
NE	Ihara et al., "Requirement of the Pro-Cys-His-Arg sequence for O <sup>6</sup> -methylguanine DNA methyltransferase activity revealed by saturation mutagenesis with negative and positive screening," <i>Mol Gen Genet</i> <b>243</b> (4): 379-389 (1994 May 25)
NE	Krishnan et al., "Direct and crossover PCR amplifications to facilitate Tn5supF-based sequencing of alpha phage clones", <i>Nucl. Acids Res.</i> <b>19</b> :6177-82 (1991)
NE	J.W. Little, "Saturation mutagenesis of specific codons: elimination of molecule with stop codons from mixed pools of DNA," <i>Gene</i> <b>88</b> (1): 113-115 (1990 Mar 30)
NE	Marks et al., "Bypassing Immunization: Building High Affinity Human Antibodies by Chain Shuffling", <i>Biotechnology</i> <b>10</b> :779-783.
NE	Meyerhans et al., "DNA recombination during PCR," <i>Nucleic Acids Res.</i> <b>18</b> :1687-91 (1990)
NE	Moore et al., "Strategies for the in vitro Evolution of Protein Function: Enzyme Evolution by Random Recombination of Improved Sequences", <i>J. Mol. Biol.</i> <b>272</b> :336-347 (1997)
NE	Morris and McIvor, "Saturation mutagenesis at dihydrofolate reductase codons 22 and 31. A variety of amino acid substitutions conferring methotrexate resistance," <i>Biochem Pharmacol</i> <b>47</b> (7): 1207-1220 (1994 Mar 29)
NE	Olesen and Kielland-Brandt, "Altering substrate preference of carboxypeptidase Y by a novel strategy of mutagenesis eliminating wild type background," <i>Protein Eng</i> <b>6</b> (4): 409-415 (Jun 1993)
NE	Olins et al., "Saturation mutagenesis of human interleukin-3," <i>J Biol Chem</i> <b>270</b> (40): pp 23754-123760 (6 October 1995)
NE	Oliphant and Struhl, "An efficient method for generation proteins with altered enzymatic properties: application to beta-lactamase," <i>Proc Natl Acad Sci USA</i> <b>86</b> (23): 9094-9098 (Dec 1989)
NE	Oliphant et al., "Cloning of random-sequence oligodeoxynucleotides," <i>Gene</i> <b>44</b> (2-3): 177-183 (1986)
*	<del>Osuna et al., "combinatorial mutagenesis of three major groove-contacting residues of EcoRI: single and double amino acid replacements retaining methyltransferase-sensitive activities," <i>Gene</i> <b>116</b>(1): 7-12 (1991 Sep 30)</del>

EXAMINER <i>N. Sheel</i>	DATE CONSIDERED <i>8/5/03</i>
EXAMINER: Initial if citation is considered, whether or not citation is in conformance with MPEP § 609: Draw Line through citation if not conformance and not considered. Include copy with next communication to applicant.	

NEWYORK 68635v1

\* reference of record.  
\* \* reference could not be located

Subt. For, PTO-1449				Docket Number DIV-1140-3 (112766.159)		Application Number 09/663,620	
<b>INFORMATION DISCLOSURE IN AN APPLICATION</b>  <i>(Use several sheets if necessary)</i>				Applicant <b>Jay M. Short</b>			
				Filing Date <b>September 15, 2000</b>		Group Art Unit <b>1652</b>	
Sheet	4	OF	4				

NE	Patten et al., "Applications of DNA shuffling to pharmaceuticals and vaccines", <i>Curr. Opin. In Biotech.</i> :724-33 (1997)
NE	Reidhaar-Olson et al., "Random mutagenesis of protein sequences using oligonucleotide cassettes", <i>Methods Enzymology</i> 208:564-86 (1991)
NE	Reidhaar-Olson and Sauer, "Combinatorial Cassette Mutagenesis as a Probe of the Information Content of Protein Sequences", <i>Science</i> 241:53-57 (Jul. 1998)
NE	Roberts et al., "Directed evolution of a protein: selection of potent neutrophil elastase inhibitors displayed on M13 fusion phage," <i>Proc Natl Acad Sci USA</i> 89(6): 2429-2433 (1992 Mar 15)
NE	Sherman et al., "Saturation mutagenesis of the plasminogen activator inhibitor-1 reactive center," <i>J Biol Chem</i> 267(11): 7588-7595 (1992 Apr 15)
NE	Singh et al., "Saturation mutagenesis of the octopine synthase enhancer: correlation of mutant pgenotypes with binding of a nuclear protein factor," <i>Proc Natl Acad Sci USA</i> 86(10): 3733-3737 (May 1989)
NE	K. Sirotkin, "A computer program to display codon changes caused by a mutagenesis," <i>Comput Appl Biosci</i> 4(2): 243-247 (Apr 1988)
NE	K. Sirotkin, "Advantages to mutagenesis techniques generated populations containing the complete spectrum, of single codon changes," <i>J Theor Biol</i> 123(3): 261-279 (1986 Dec 7)
NE	Soteropoulos and Perlin, "Genetic probing of the stalk segments associated with M2 and M3 of the plasma membrane H <sup>+</sup> -ATPase from <i>Saccharomyces cerevisiae</i> ," <i>J Biol Chem</i> 273(41): 26426-26431 (1998 Oct 9)
NE	Soteropoulos et al., "Molecular genetic probing of energy coupling by the yeast plasma membrane proton pump," <i>Acta Physiol Scand</i> 643: 115-122 (Aug 19998)
NE	W. Stemmer, "DNA shuffling by random fragmentation and reassembly: In Vitro recombinations for molecular evolution", <i>PNAS USA</i> 91:10747-51 (Oct. 1994)
NE	W. Stemmer, "Evolution of a protein in vitro by DNA shuffling", <i>Nature</i> 370:389-91 (Aug. 1994) ✓
NE	Stemmer et al., "Selection of an Active Single Chain Fv Antibody from a Protein Linker Library Prepared by Enzymatic Inverse PCR", <i>Biotechniques</i> 14:256-65 (1993).
NE	Tsiang et al., "Protein engineering tyrombin for optimal specificity and potency of anticoagulant activity <i>in vivo</i> ," <i>Biochemistry</i> 35(51): 16449-16457 (1996 Dec 24)
NE	Warren et al., "A rapid screen of active site mutants in glycylamide ribonucleotide transformylase," <i>Biochemistry</i> 35(27): 8855-8862 (1996 Jul 9)
NE	Weiner et al., "A method for the site-directed mono- and multi-mutagenesis of double stranded DNA," <i>Gene</i> 126(1): 35-41 (1993 Apr 15)
NE	Wells et al., "Cassette mutagenesis: an efficient method for generation of multiple mutations at defined sites," <i>Gene</i> 34(2-3): 315-323 (1985)
NE	White et al., "Improved thermostability of the North American firefly luciferase: saturation mutagenesis at position 354," <i>Biochem</i>
NE	Yelton et al., "Affinity maturation of the BR96 anti-carcinoma antibody by codon-based mutagenesis," <i>J Immunol</i> 155(4): 1994-2004 (1995 Aug 15)
NE	Ziliacius et al., "Evolution of distinct DNA-binding specificities within the nuclear receptor family of transcription factors," <i>Proc Natl Acad Sci USA</i> 91(10): 4175-4179 (1994 May 10)
NE	Zhao et al., "Functional and nonfunctional mutations distinguished by random recombination of homologous genes," <i>Proceedings of the National Academy of Sciences, USA</i> , 94: 7997-8000 (July 1997)
NE	Zhao et al., "Optimization of DNA shuffling for high fidelity recombination," <i>Nucleic Acids Research</i> , 25(6): 1307-1308 (March 15, 1997)
NE	Dube et al., "Artificial Mutant generated by the insertion of random oligonucleotides into the putative..." <i>Biochem</i> 30:11760-11767 (1991)
NE	Schultz et al., "Site-saturation studies of beta lactamase: production and characterization of mutant beta-lactamases with all possible amino acid substitutions at residue 71", <i>PNAS USA</i> 83:1588-92 (1986) ✓
NE	Stemmer W, "Rapid Evolution of a protein in vitro by DNA Shuffling", <i>Nature</i> 370:389-91 (1994)

EXAMINER <i>NE</i>	DATE CONSIDERED <i>8/5/03</i>
EXAMINER: Initial if citation is considered, whether or not citation is in conformance with MPEP § 609: Draw Line through citation if not conformance and not considered. Include copy with next communication to applicant.	

NEWYORK 68635v1

*\*\* Reference could not be located*